

**Listing of Claims:**

1. (Currently Amended) An image pickup system for processing an image signal at each pixel which ~~is composed of more than one~~ comprises a plurality of color signals, and one or more of the color signals are dropped out according to ~~the~~ a location of the pixel, the image pickup system comprising:

first interpolation means for interpolating the color signals dropped-out from the image signals by a first interpolation method;

precision verification means for verifying the interpolation precision based on ~~the basis of~~ the image signals and the color signals interpolated by the first interpolation means; and

second interpolation means for interpolating the color signals dropped-out from the image signals by a second interpolation method that is different from the first interpolation method in cases where it is judged that the interpolation precision by the first interpolation method is insufficient.

2. (Currently Amended) An image pickup system for processing an image signal at each pixel which ~~is composed of more than one~~ comprises a plurality of color signals, and one or

more of the color signals are dropped out according to ~~the~~ a  
5 location of the pixel, the image pickup system comprising:

separation means for separating the image signals into first  
image signals and second image signals based on ~~the basis of~~  
predetermined characteristics relating to the image signals;

10 first interpolation means for interpolating the dropped-out  
color signals from the first image signals by a first  
interpolation method;

second interpolation means for interpolating the dropped-out  
color signals from the second image signals by a second  
interpolation method that is different from the first  
15 interpolation means;

precision verification means for verifying the interpolation  
precision based on ~~the basis of~~ the first image signals and the  
color signals interpolated by the first interpolation means for  
the regions of the first image signals, and verifying the  
20 interpolation precision based on ~~the basis of~~ the second image  
signals and the color signals interpolated by the second  
interpolation means for the regions of the second image signals;  
and

adjustment means for causing interpolation processing of the  
25 dropped-out color signals to be performed again from the image  
signals by the second interpolation means when insufficient  
interpolation was performed by the first interpolation means, and

for causing interpolation processing of the dropped-out color signals to be performed again from the image signals by the first interpolation means when insufficient interpolation was performed by the second interpolation means, in cases where it is judged that the interpolation precision is insufficient.

3. (Currently Amended) An image pickup system for processing an image signal at each pixel which ~~is composed of more than one~~ comprises a plurality of color signals, and one or more of the color signals are dropped out according to ~~the~~ a location of the pixel, the image pickup system comprising:

first interpolation means for interpolating the color signals dropped-out from the image signals by a first interpolation method;

second interpolation means for interpolating the color signals dropped-out from the image signals by a second interpolation method that is different from the first interpolation method;

precision verification means for verifying the interpolation precision based on ~~the basis of~~ the image signals, the color signals interpolated by the first interpolation means and the color signals interpolated by the second interpolation means; and

selection means for selecting color signals having a higher interpolation precision between the color signals interpolated by

the first interpolation means and the color signals interpolated  
20 by the second interpolation means.

4. (Currently Amended) The image pickup system according  
to claim 1, ~~characterized in that~~ wherein the first interpolation  
means or second interpolation means comprises:

extraction means for extracting regions of a predetermined  
5 size centered on pixels of interest from the image signals,

edge extraction means for extracting a plurality of edge  
intensities relating to predetermined directions from the pixels  
of interest within the extracted regions,

weighting calculation means for calculating weighting  
10 coefficients that are normalized from the extracted edge  
intensities,

interpolation signal calculation means for calculating a  
plurality of interpolation signals relating to predetermined  
directions from the pixels of interest within the extracted  
15 regions, and

calculation means for calculating the dropped-out color  
signals in the pixels of interest based on ~~the basis of~~ a  
plurality of weighting coefficients relating to the predetermined  
directions and a plurality of interpolation signals relating to  
20 the predetermined directions.

5. (Currently Amended) The image pickup system according to claim 1, ~~characterized in that~~ wherein the first interpolation means or second interpolation means comprises:

extraction means for extracting regions of a predetermined size centered on pixels of interest from the image signals, and

calculation means for calculating the dropped-out color signals in the pixels of interest within the extracted regions by linear interpolation or cubic interpolation.

6. (Currently Amended) The image pickup system according to claim 1, ~~characterized in that~~ wherein the first interpolation means or second interpolation means comprises:

extraction means for extracting regions of a predetermined size centered on pixels of interest from the image signals,

correlation calculation means for determining ~~as a linear equation~~ the correlation between the respective color signals within the extracted regions as a linear equation, and

calculation means for calculating the dropped-out color signals based on ~~the basis of~~ the image signals and the correlation.

7. (Currently Amended) The image pickup system according to claim 1, ~~characterized in that~~ wherein the precision verification means comprises:

correlation calculation means for determining correlation  
5 information relating to the correlations between the respective  
color signals for each predetermined region based on ~~the basis of~~  
the image signals and the color signals interpolated by the first  
interpolation means, and

correlation verification means for verifying the  
10 interpolation precision based on ~~the basis of~~ the correlation  
information.

8. (Currently Amended) The image pickup system according  
to claim 1, ~~characterized in that~~ wherein the precision  
verification means comprises:

hue calculation means for determining hue information for  
5 each pixel based on ~~the basis of~~ the image signals and the color  
signals interpolated by the first interpolation means, and

hue verification means for verifying the interpolation  
precision based on ~~the basis of~~ the hue information.

9. (Currently Amended) The image pickup system according  
to claim 1, ~~characterized in that~~ wherein the precision  
verification means comprises:

edge calculation means for determining edge information for  
5 each predetermined region based on ~~the basis of~~ the image signals

and the color signals interpolated by the first interpolation means, and

edge verification means for verifying the interpolation precision based on ~~the basis of~~ the edge information.

10. (Currently Amended) The image pickup system according to claim 2, ~~characterized in that~~ wherein the separation means comprises:

edge calculation means for determining edge information for  
5 each predetermined region from the image signals, and

image signal separation means for separating the image signals based on ~~the basis of~~ the edge information.

11. (Currently Amended) The image pickup system according to claim 2, ~~characterized in that~~ wherein the separation means comprises:

correlation calculation means for determining correlation  
5 information relating to the correlations between the respective color signals for each predetermined region from the image signals, and

image signal separation means for separating the image signals based on ~~the basis of~~ the correlation information.

12. (Currently Amended) The image pickup system according to claim 1, further comprising control means ~~that can control for~~ controlling the precision verification means and the second interpolation means such that the operation of the precision verification means and the operation of the second interpolation means ~~are~~ can be stopped.

13. (Currently Amended) The image pickup system according to claim 2, further comprising control means ~~that can control for~~ controlling the precision verification means and the second interpolation means such that the operation of the precision verification means and the operation of the adjustment means ~~are~~ can be stopped.

14. (Currently Amended) The image pickup system according to claim 3, further comprising control means ~~that can control for~~ controlling the precision verification means and the second interpolation means such that the operation of the second interpolation means and the operation of the precision verification means ~~are~~ can be stopped, and ~~that can control for~~ controlling the selection means such that when ~~these operations~~ the operation of the second interpolation means and the operation of the precision verification means are stopped, the selection

5



10 means is caused to select only the color signals that are  
interpolated by the first interpolation means.

15. (Currently Amended) The image pickup system according  
to claim 12, ~~characterized in that~~ wherein the control means  
comprises:

\_\_\_\_\_information acquisition means for acquiring at least one  
5 type of information selected from a set comprising image quality  
information relating to the image quality of the image signals,  
image pickup mode information set in the image pickup system, and  
interpolation processing switching information that can be  
manually set, and

10 judgment means for judging whether or not the operations are  
to be stopped based on ~~the basis of~~ at least one type of  
information selected from a set comprising the image quality  
information, image pickup mode information, and interpolation  
processing switching information.

16. (Currently Amended) ~~An~~ A computer-readable recording  
medium having stored thereon an image processing program for  
processing, by means of a computer, an image signal at each pixel  
which ~~is composed of more than one~~ comprises a plurality of color  
5 signals, and one or more of the color signals are dropped out

according to the location of the pixel, the image processing program causing the computer to function as:

first interpolation means for interpolating the color signals dropped-out from the image signals by a first interpolation method;

precision verification means for verifying the interpolation precision based on ~~the basis of~~ the image signals and the color signals interpolated by the first interpolation means; and

second interpolation means for interpolating the color signals dropped-out from the image signals by a second interpolation method that is different from the first interpolation method in cases where it is judged that the interpolation precision is insufficient.

17. (Currently Amended) ~~An~~ A computer-readable recording medium having stored thereon an image processing program for processing, by means of a computer, an image signal at each pixel which ~~is composed of more than one~~ comprises a plurality of color signals, and one or more of the color signals are dropped out according to the location of the pixel, the image processing program causing the computer to function as:

separation means for separating the image signals into first image signals and second image signals based on ~~the basis of~~ predetermined characteristics relating to the image signals;

first interpolation means for interpolating the color signals dropped-out from the first image signals by a first interpolation method;

15 second interpolation means for interpolating the color signals dropped-out from the second image signals by a second interpolation method that is different from the first interpolation means;

20 precision verification means for verifying the interpolation precision based on ~~the basis of~~ the first image signals and the color signals interpolated by the first interpolation means for the regions of the first image signals, and for verifying the interpolation precision based on ~~the basis of~~ the second image signals and the color signals interpolated by the second interpolation means for the regions of the second image signals;

25 and

adjustment means for causing interpolation processing of the dropped-out color signals to be performed again from the image signals by the second interpolation means when insufficient interpolation was performed by the first interpolation means, and

30 for causing interpolation processing of the dropped-out color signals to be performed again from the image signals by the first interpolation means when insufficient interpolation was performed by the second interpolation means, in cases where it is judged that the interpolation precision is insufficient.

18. (Currently Amended) ~~An~~ A computer-readable recording medium having stored thereon an image processing program for processing, by means of a computer, an image signal at each pixel which is composed of more than one comprises a plurality of color  
5 signals, and one or more of the color signals are dropped out according to the location of the pixel, the image processing program causing the computer to function as:

first interpolation means for interpolating the color signals dropped-out from the image signals by a first  
10 interpolation method;

second interpolating means for interpolating the color signals dropped-out from the image signals by a second interpolation method that is different from the first interpolation method;

15 precision verification means for verifying the interpolation precision based on ~~the basis~~ the color signals, the color signals being interpolated by the first interpolation means and by the second interpolation means; and

20 selection means for selecting color signals that have a higher interpolation precision between the color signals that are interpolated by the first interpolation means and the color signals that are interpolated by the second interpolation means.

19. (New) The image pickup system according to claim 2, wherein the first interpolation means or second interpolation means comprises:

extraction means for extracting regions of a predetermined  
5 size centered on pixels of interest from the image signals;

edge extraction means for extracting a plurality of edge intensities relating to predetermined directions from the pixels of interest within the extracted regions;

10 weighting calculation means for calculating weighting coefficients that are normalized from the extracted edge intensities;

interpolation signal calculation means for calculating a plurality of interpolation signals relating to predetermined directions from the pixels of interest within the extracted  
15 regions; and

calculation means for calculating the dropped-out color signals in the pixels of interest based on a plurality of weighting coefficients relating to the predetermined directions and a plurality of interpolation signals relating to the  
20 predetermined directions.

20. (New) The image pickup system according to claim 2, wherein the first interpolation means or second interpolation means comprises:

extraction means for extracting regions of a predetermined  
5 size centered on pixels of interest from the image signals; and  
calculation means for calculating the dropped-out color  
signals in the pixels of interest within the extracted regions by  
linear interpolation or cubic interpolation.

21. (New) The image pickup system according to claim 2,  
wherein the first interpolation means or second interpolation  
means comprises:

extraction means for extracting regions of a predetermined  
5 size centered on pixels of interest from the image signals;  
correlation calculation means for determining the  
correlation between the respective color signals within the  
extracting regions as a linear equation; and  
calculation means for calculating the dropped-out color  
signals based on the image signals and the correlation.

22. (New) The image pickup system according to claim 2,  
wherein the precision verification means comprises:

correlation calculation means for determining correlation  
information relating to the correlations between the respective  
5 color signals for each predetermined region based on the image  
signals and the color signals interpolated by the first  
interpolation means, and

correlation verification means for verifying the interpolation precision based on the correlation information.

23. (New) The image pickup system according to claim 2, wherein the precision verification means comprises:

hue calculation means for determining hue information for each pixel based on the image signals and the color signals  
5 interpolated by the first interpolation means, and

hue verification means for verifying the interpolation precision based on the hue information.

24. (New) The image pickup system according to claim 2, wherein the precision verification means comprises:

edge calculation means for determining edge information for each predetermined region based on the image signals and the  
5 color signals interpolated by the first interpolation means, and

edge verification means for verifying the interpolation precision based on the edge information.

25. (New) The image pickup system according to claim 3, wherein the first interpolation means or second interpolation means comprises:

extraction means for extracting regions of a predetermined  
5 size centered on pixels of interest from the image signals;

edge extraction means for extracting a plurality of edge intensities relating to predetermined directions from the pixels of interest within the extracted regions;

weighting calculation means for calculating weighting  
10 coefficients that are normalized from the extracted edge intensities;

interpolation signal calculation means for calculating a plurality of interpolation signals relating to predetermined directions from the pixels of interest within the extracted  
15 regions; and

calculation means for calculating the dropped-out color signals in the pixels of interest based on a plurality of weighting coefficients relating to the predetermined directions and a plurality of interpolation signals relating to the  
20 predetermined directions.

26. (New) The image pickup system according to claim 3, wherein the first interpolation means or second interpolation means comprises:

extraction means for extracting regions of a predetermined  
5 size centered on pixels of interest from the image signals; and

calculation means for calculating the dropped-out color signals in the pixels of interest within the extracted regions by linear interpolation or cubic interpolation.



27. (New) The image pickup system according to claim 3, wherein the first interpolation means or second interpolation means comprises:

5 extraction means for extracting regions of a predetermined size centered on pixels of interest from the image signals;

correlation calculation means for determining the correlation between the respective color signals within the extracting regions as a linear equation; and

calculation means for calculating the dropped-out color signals based on the image signals and the correlation.

28. (New) The image pickup system according to claim 3, wherein the precision verification means comprises:

5 correlation calculation means for determining correlation information relating to the correlations between the respective color signals for each predetermined region based on the image signals and the color signals interpolated by the first interpolation means, and

correlation verification means for verifying the interpolation precision based on the correlation information.

29. (New) The image pickup system according to claim 3, wherein the precision verification means comprises:

hue calculation means for determining hue information for  
each pixel based on the image signals and the color signals  
5 interpolated by the first interpolation means, and

hue verification means for verifying the interpolation  
precision based on the hue information.

30. (New) The image pickup system according to claim 3,  
wherein the precision verification means comprises:

edge calculation means for determining edge information for  
each predetermined region based on the image signals and the  
5 color signals interpolated by the first interpolation means, and

edge verification means for verifying the interpolation  
precision based on the edge information.

31. (New) The image pickup system according to claim 13,  
wherein the control means comprises:

information acquisition means for acquiring at least one  
5 type of information selected from a set comprising image quality  
information relating to the image quality of the image signals,  
image pickup mode information set in the image pickup system, and  
interpolation processing switching information that can be  
manually set, and

10 judgment means for judging whether or not the operations are  
to be stopped based on at least one type of information selected

from a set comprising the image quality information, image pickup mode information, and interpolation processing switching information.

32. (New) The image pickup system according to claim 14, wherein the control means comprises:

information acquisition means for acquiring at least one type of information selected from a set comprising image quality  
5 information relating to the image quality of the image signals, image pickup mode information set in the image pickup system, and interpolation processing switching information that can be manually set, and

judgment means for judging whether or not the operations are  
10 to be stopped based on at least one type of information selected from a set comprising the image quality information, image pickup mode information, and interpolation processing switching information.